Sensory processing

Every minute of every day we receive sensory information from the environment and within our own bodies. How effectively we process this information affects how we concentrate, behave and respond. Good sensory processing forms the basis of all learning experiences. It enables us to develop skills and behave appropriately in any given situation.

Senses

There are seven senses. The first five are commonly known:

- Auditory (hearing)
- Visual (sight)
- Olfactory (smell)
- Gustatory (taste)
- Tactile (touch)

But there are two more senses that are really important:

- The Vestibular Sense (movement and balance)
- The Proprioceptive Sense (body awareness).

All our senses are important in learning but the following three senses are crucial for the development of concentration and coordination.

Sense of touch (The Tactile system)

Our sense of touch (tactile sense) comes from receptors in our skin all over our bodies. Information is sent to the brain about the type of touch eg deep pressure, light touch, pain, temperature and vibration in order to make an appropriate response. If the brain does not process the touch sensation accurately then we may be described as over responsive or under-responsive to touch sensation and this will affect our behaviour.

Over-responsive tactile system

What you may see	Possible solutions to try
• Avoidance of touch. • Dislike of hugs. • Child becomes very disorganised, over emotional and/or out of control if they experience games that involve a lot of touch e.g. rough and tumble. • Over-react to someone brushing past them in the corridor. • Child avoids messy play. • Child prefers to wear long sleeves even though it is a very hot day. • Child dislikes the textures of certain clothes or material on the skin e.g. labels, seams. • Child dislikes walking barefoot on certain surfaces (grass, sand).	• Provide different tactile experiences and activities. Do not force the child to join in. Offer any new tactile experiences in small amounts at first. • Avoid 'light touch' activities • Use firm rather than light touch, deep pressure - massage rather than tickling • Combine tactile activities with opportunities to experience proprioception. • Allow space around the child in class. • Always position the child at the end of a queue. • Identify and encourage the use of fidget toys. These are toys or objects easily played within the hand. They are quite often squeezy/stretchy objects. They are particularly effective in assembly or when sitting at desk for long period or getting to sleep at night. Try attaching or tying a small object to trouser belt loops to be kept in a pocket. • Encourage the child to squeeze slowly along their hands and arms. • Encourage the child to place their hands on top of their head and push down for slow count of five. • Avoid crowded places. • Wear comfortable clothing or tight Lycra cycling tops. • Use a calm quiet monotone voice to create a calm environment. • Empathise – what is tolerable for one person is unpleasant for another.

Under-responsive tactile system

What you may see	Possible solutions to try
• Appears to have a dulled sense of touch. • Doesn't register pain or react to cuts or bruises. • Poor fine motor skills. • Weak grip. • Likes messy play more than most children. • Seeks touching and fiddling with all objects. • Poor body awareness • Doesn't notice if clothes not tucked in or on straight. • Doesn't notice if face or hands are messy. • Seeks lots of hugs.	• Give more opportunities to experience activities that involve increased feeling through the skin. e.g. a Lego activity where the child is finding pieces in a box of other Lego is better than playing on a 'games' console or similar device. • Play 'What's in the Box/bag'. Introduce a number of objects previously seen by the child into a box or bag where they cannot see. They have to find the object you ask for. • Creative activities using glue, clay, different textures are also useful. • Identify and encourage the use of fidget toys. These are toys or objects easily played within the hand. They are quite often squeezy objects. They are often particularly effective in assembly or when sitting at desk or getting to sleep at night. Try attaching or tying a small object to a child's trouser belt loops to be kept in a pocket • Encourage using a mirror when dressing to check for tidiness • Encourage checking if face is clean after eating

Sense of movement (The vestibular system)

The vestibular sense provides us with a good posture, balance and movement sensation. Our movement receptors are located in our inner ear and send information about our position and how we are moving to the brain. If the brain does not process the movement sensation accurately then we may be described as over- responsive or under-responsive to movement sensation and this will affect our behaviour. If the brain is over-responsive, it can become easily overwhelmed by a movement experience causing fear, anxiety and avoidance or if under-responsive it may seek out more movement experiences to satisfy the need.

Over-responsive movement system

What you may see	Possible solutions to try
• Child is fearful of movement. • Child dislikes escalators or lifts. • Child does not like playing on playground equipment. • Child may be travel sick. • Dislike head tilted back e.g. hair washing, rough and tumble.	• When travelling encourage the child to look out of the window and hold a toy/object that is easy to fidget with without looking e.g. a squeezy toy. • Give the child options i.e to use the stairs rather than a lift or escalator. • Encourage participation in the type of movement the child does enjoy and tolerates. • Never force a child to participate in an activity. • Combine movement activities with opportunities to experience proprioception – see advice sheet below.

Under-responsive system or problems processing movement information

What you may see	Possible solutions to try
• Child is always 'on the go' more than their peers. • Child seems to need movement in order to concentrate and attend. • Child appears to take excessive risks e.g. shows no fear when jumping from a big height.	• Provide the child with ample opportunities to experience movement e.g. going to the park regularly, swimming, trampolining, etc. • Create a safe environment in which the child can experience movement. If purchasing a garden trampoline ensure it has a safety net. • Provide more practise with certain movement related skills such as jumping, swinging. • Split the child's day into small sections allowing for frequent movement breaks. • Try sitting on a movement inflatable cushion e.g. movin' sit cushion or disc cushion.

Sense of body position (Proprioception)

Closely related to the vestibular sense is the sense of proprioception which gives us an awareness of body position. It lets us know where our body is in relation to the immediate space around us. It also lets us know how to move our body and how much force we need to use to carry out a task.

When proprioception is processed well, an individual's body position is automatically adjusted and this helps with every aspect of our day e.g. negotiating our way around objects in a room or preventing us from falling out of a chair.

Proprioception also allows objects such as pencils, buttons, spoons and combs to be skilfully manipulated by the hand; to pick up a glass of water without spilling it.

The proprioceptive system also has another role – it helps us to modulate and calm our arousal level so that we can attend and focus.

Our proprioceptive system has receptors located within our muscles and joints. These receptors or sensors are triggered when they are squashed or pulled apart during movement. Many of the activities suggested stimulate this sensation as it is so useful to the body and brain.

Problems related to the proprioceptive system

What you may see	Possible solutions to try
• Appears heavy handed, over forceful perhaps damaging toys unintentionally. • Walking into others whilst looking ahead. • Tripping over. • Falling from chairs. • Poor fine motor skills compared to peers – difficulties with precision movements. • Poor body awareness e.g. difficulty assuming postures in P.E. • Poor use of force when writing either too much or not enough. • Emotionally fragile. • Low self-esteem.	• Think of lots of activities that involve effort. The proprioceptive system is stimulated by pulling or pushing and heavy work activities. • Wear a rucksack. • Examples of activities include; helping with jobs around the house, gardening, pushing a trolley/wheel barrow/heavy doors, swimming, trampolining, playground equipment, jumping, running, cycling, kneading dough, modelling with clay,tug of war. • Make sure there are rewards for help given. Remember the jobs mentioned above can be very tiring so the secret is make it motivating for the child to participate little and often. • Create a 'fidget-box' squeezy or stretchy toys, and allow the child to choose an object when they are finding it hard to concentrate or calm down e.g. Blue Tac, theraputty. • Jumping, star jumps. • Chair push ups, sit on hands and push with arms to raise bottom from the seat. • Place hands on head and push down for slow count of five. • Place hands together in prayer position and push palms together for slow count of five.

Auditory Processing (Hearing)

If the brain does not process noise accurately then we may be described as over responsive or under-responsive to noise sensation and this will affect our behaviour. We may need more or less noise in our environment in order to help us focus on a task.

Over-responsive auditory system

What you may see	Possible solutions to try
• Child over-reacts to school bells, loud noise, thunder, vacuum cleaner, hairdryer, fire drills or sudden noises. • Child often places their hands over their ears. • Child appears less able to concentrate or focus in a noisy environment. • Child makes own noises more persistently than peer group. • Show frequent startle reactions to noise. • Notice even small sounds	• Encourage the use of proprioceptive activities above. • Soft, calm music played into ear phones may aid concentration and calm a child. Try using classical music. Make sure the music is not played too loudly through the earphones. • Allow the child to carry out activities in a quiet environment at intervals throughout the day. This may involve the child working with a small group of friends outside the main classroom. • Allow the child something to fidget with something and use the proprioceptive ideas above • White noise can be downloaded from the internet and this can also be useful when played quietly through ear phones. • Earphones (without additional noise) or a tighter fitting hat can provide relief from noise.

Under-responsive system or problems registering auditory information

What you may see	Possible solutions to try
• Child doesn't seem to notice when their name is called. • Child enjoys and seeks out loud or unusual noises more than peers. • Have a disregard of sudden or loud noises. • Not pay attention in a noisy environment/or to people. • Show delayed responses to noise. • Make noise by tapping, humming, whistling etc. • Need noise to increase their levels of alertness.	• Try to make sure that you gain eye contact with the child when you need their attention. • Understand that a child's lack of response may not necessarily be under their control. • Allow the child the opportunity to be noisy in a controlled environment. • Make sure that any MP3 players/Ipods are played at a reasonable noise level to avoid damaging the ear.

Visual Processing

If the brain does not process visual sensation accurately then we may be described as over responsive or under-responsive to visual sensation and this will affect our behaviour.
We may need more or less visuals in our environment in order to help us focus on a task.

Over-responsive visual system

What you may see	Possible solutions to try
• Behaviour of child becomes more erratic in a busier more visually stimulating environment. • Is visually distracted by others. • Notices everything that's happening in the room. • Child keeps head and eyes facing downwards most of the time. • Startle at visual input. • Show a sensitivity to light. • Be irritated by bright lights. • Prefer sunglasses/peak cap.	• Allow the child to carry out activities in a less visually stimulating environment at intervals throughout the day. This may mean creating a suitable environment in the Pre-school classroom such as a blank corner separated by dividers or a table covered in a sheet that the child can crawl under. • Child may like to wear sunglasses. • Keep lighting dim. • In the classroom, try the child sat facing a blank wall when working at a desk and sat directly in front of the teacher / whiteboard when listening to class discussion.

Under-responsive visual system

What you may see	Possible solutions to try
• Child may appear unkempt or lacks ability to present themselves smartly. • Child may not notice details in pictures. • Show a lack of attention to environment/people. • Often misses visual cues.	• Practice games such as; I spy, Where's Wally books Kim's game, puzzle books, word searches. • Practise reading using a ruler under the line of text. • Use lined paper for writing. • Make sure the child's eyes are tested at an optician's.

What else can you do to help?

1. Understand that poor performance may not be due to lack of effort.
2. Try to help the child organise tasks into more manageable steps.
3. Consider the position of the child in the classroom.
   Be aware of distraction (Light, colour, and noise), teacher position, whiteboard etc.

References and reading list:

How does your engine Run – A Leaders Guide to The Alert Program for Self-Regulation
Mary Sue Williams & Sherry Shellenberger.

Raising a Sensory Smart Child
Biel & Peske (2005) England Penguin Ltd.

The Out of Sync child: Coping with Sensory Integration Problems
Carol Stock Kranowitz (1998)

Take 5, Staying Alert at Home and School
Williams & Shellenberger (2001),
Therapy Works, Albuquerque.

Building Bridges through Sensory Integration
Yack, Aquilla & Sutton (2002), Future Horizons.

Sensational Kids: Hope and Help for Children with Sensory Processing Disorder
Lucy Jane Miller (2006), Penguin Group USA

Guide to Dyspraxia and Developmental Co-ordination Disorders
Andrew Kirby, Sharon Drew(2003) David Fulton Publishers LTD

The Inclusive Early Childhood Classroom - Easy Ways to adapt Learning Centres for all Children
Patti Gould and Joyce Sullivan